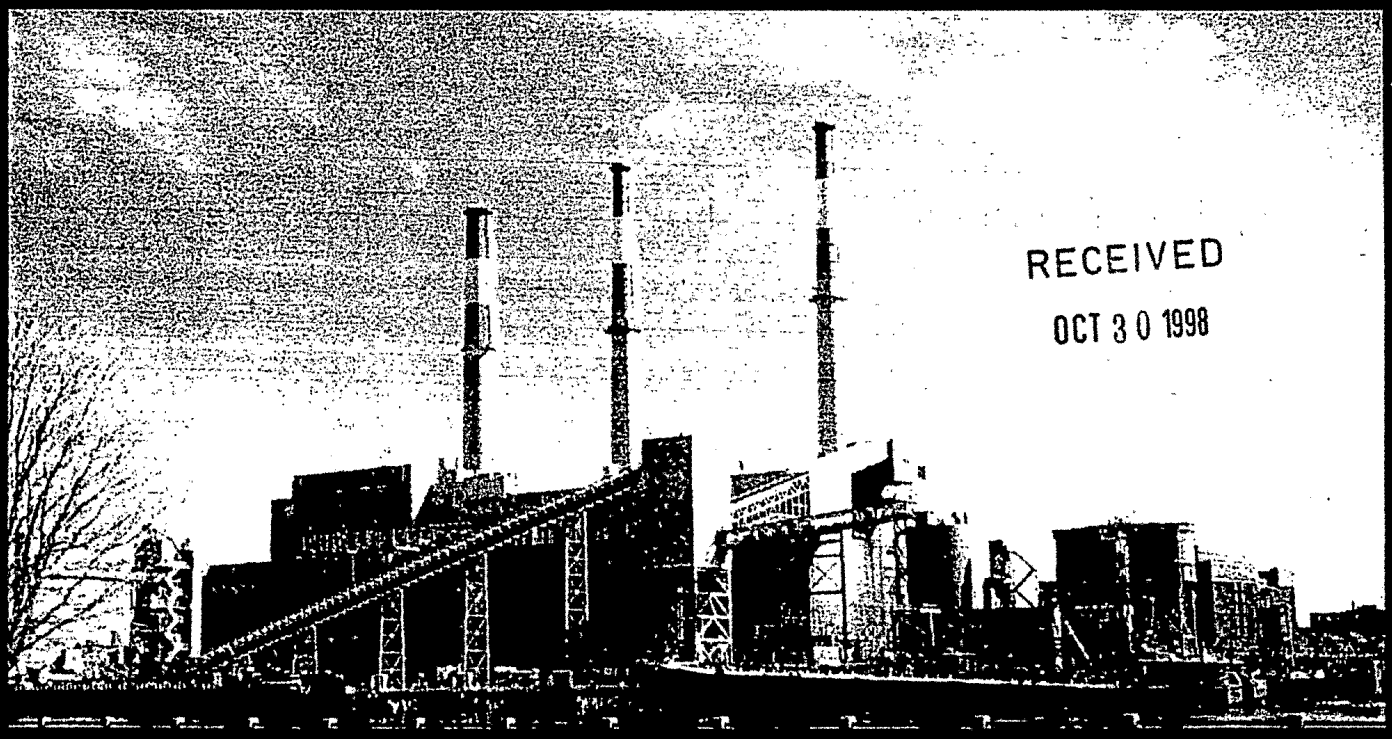
Consolidated Edison Company of New York, Inc.



Phase II Environmental Site Investigation Work Plan at Ravenswood Generating Station

August 1998

ENVIRONMENTAL CORPORATION

Work Plan for Site Investigation at the Ravenswood Generating Station Long Island City, New York

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1-1
1.1 PHASE II OBJECTIVES 1-3
1.2 WORK PLAN APPROACH 1-3
2.0 ENVIRONMENTAL SETTINGS 2-1
2.1 SITE CONDITIONS 2-1
2.1.1 Site Description 2-1
2.1.2 Surface Conditions 2-3
2.1.3 Subsurface Conditions 2-3
2.1.4 Chemicals of Interest 2-7
2.2 PRE-PLANNING 2-7
2.2.1 Environmental Impacts 2-7
2.2.2 Former Manufactured Gas Plant Site 2-8
2.2.3 Oil Spills Identified in Appendix B of November 1994 Consent Order 2-10
2.2.4 Bluestone and Soil Contamination in Vicinity of Generator Transformers 2-14
2.3 SANBORN MAPS AND AERIAL PHOTOS 2-15
3.0 SITE INVESTIGATION SCOPE OF WORK 3-1
3.1 WORK PLAN APPENDED DOCUMENTS 3-1
3.2 SITE RECONNAISSANCE 3-1
3.3 FIELD SAMPLING ACTIVITIES 3-2
3.3.1 Subsurface Soil Sampling 3-3
3.3.2 Monitoring Well Installation and Groundwater Sampling 3-4
3.3.3 Waste Management 3-6

3.4 AREA-SPECIFIC SAMPLING PLAN 3-6
3.4.1 Bluestone and Soil Contamination in Vicinity of Generator Transformers 3-6
3.4.2 Consent Order Appendix B Oil Spills 3-7
3.4.3 Former MGP Site 3-9
3.5 DATA QUALITY OBJECTIVES 3-10
3.6 QA/QC SAMPLES 3-11
3.7 SURVEYING 3-11
3.8 SCHEDULE 3-11
3.9 SITE INVESTIGATION REPORT 3-13

APPENDIX A - Field Sampling Plan
APPENDIX B - Quality Assurance Project Plan
APPENDIX C - Health and Safety Plan

LIST OF TABLES

Table No.	Title	Page
2-1	Gas Holder Details	2-9
2-2	Analytical Testing Results Vicinity of Generator Transformers	2-15

LIST OF EXHIBITS

Exhibit No.	Title	Page
1-1	Site Location Map	1-2
1-2	Flow Chart of Site Investigation	1-4
2-1	Site Plan and Proposed Sampling Locations	2-2
2-2	Bedrock Surface Structural Map	2-6
3-1	Schedule for Phase II Environmental Site Investigation	3-12
3-2	Draft SIR Example Table of Contents	3-14

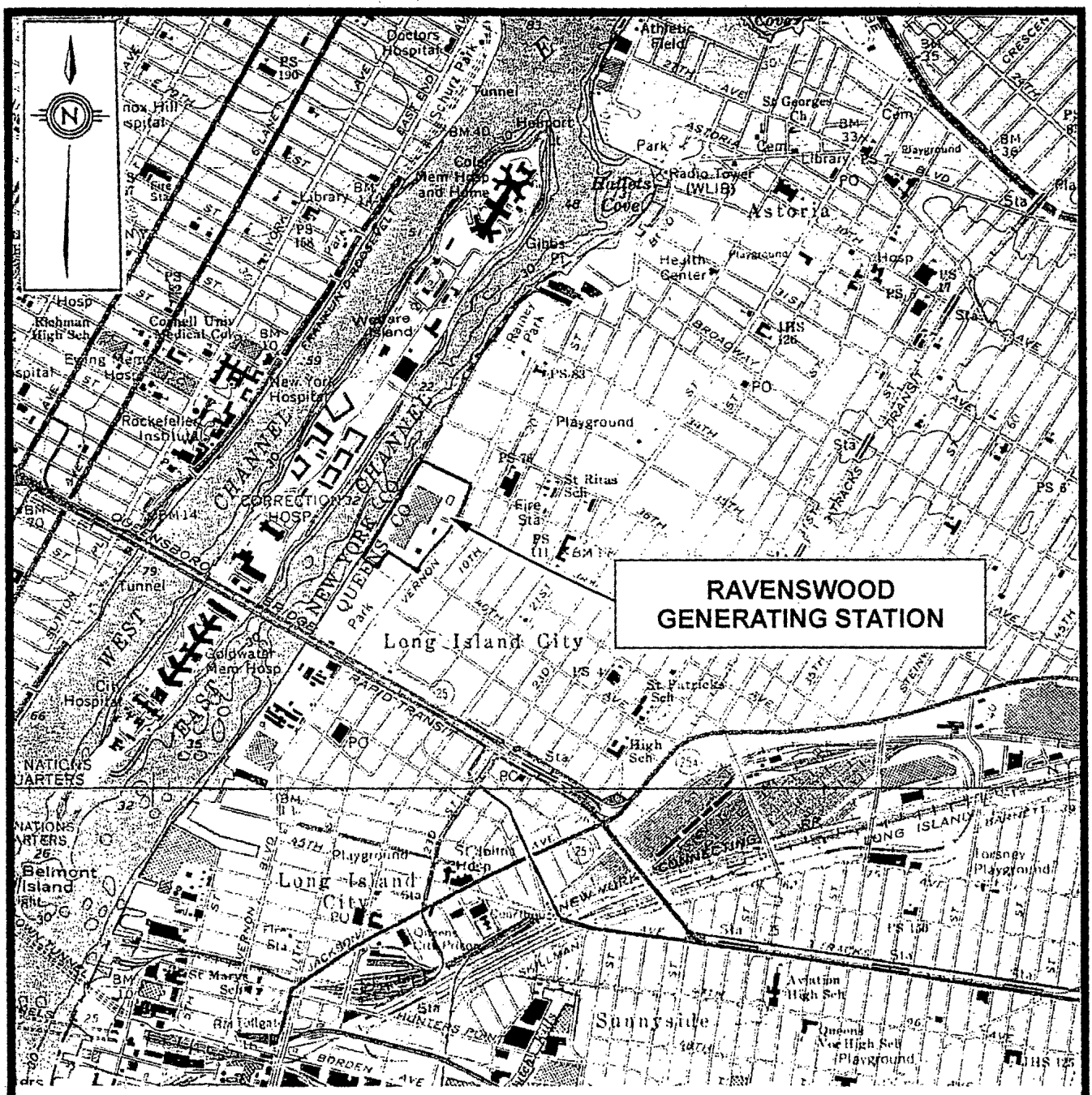
1.0 INTRODUCTION

This Phase II Site Investigation Work Plan (Work Plan) has been prepared by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) on behalf of Consolidated Edison Company of New York, Inc. (Con Edison). The Work Plan describes investigation activities to be undertaken at the Ravenswood Power Generating Station (Ravenswood). Con Edison will undertake investigation and evaluation of subsurface environmental conditions at Ravenswood Facility to provide information to potential buyers on the environmental conditions and to be consistent with the terms of the November 4, 1994 New York State Department of Environmental Conservation (NYSDEC) Consent Order (CO). Ravenswood is located at 38-54 Vernon Boulevard in Long Island City, New York. Exhibit 1-1 is the site location map.

The subsurface investigation at Ravenswood will include the collection and chemical analysis of soil and groundwater samples, evaluation of previous remedial studies, evaluation of whether an interim remedial measure may be required and preparation of a Site Investigation Report. The subsurface environmental conditions that must be investigated include the site of a former manufactured gas plant (MGP), seven identified oil spills listed in Appendix B of the CO, and areas of suspected soil and crushed stone contamination in the vicinity of generator transformers located on-site. Implementation of the Work Plan will meet the spirit and intent of the New York State Environmental Conservation Law (NYSECL), the CO, NYSDEC requirements, protocols and guidance, and United States Environmental Protection Agency (USEPA) guidelines where appropriate.

A total of 20 borings 3 hand sample locations, and 3 vacuum excavated trenches are proposed to be performed to assess near surface and subsurface soils. Soil samples from these explorations will be analyzed to determine impact by past spills and/or releases. The soil borings will also provide valuable lithologic and hydrogeologic data to support the evaluation of subsurface migration pathways at the site and evaluate the vertical and horizontal extent of contamination. Prior to starting the soil boring or trench excavation, the surface material (concrete or asphalt) will be cut and removed by the drilling contractor. Existing bluestone cover will be removed and placed on the site for surface restoration. The top 5 feet at each soil boring location will be hand dug or the soil will be removed to this depth by vacuum excavation to clear any underground utilities if present. The soil sampling locations correspond to the known spills/releases on the site and former MGP facility locations. The soil sample depth and analyses for each specific release type are discussed in Section 3.4.

In addition to the above, three 4 inch groundwater monitoring wells will be installed near No. 6 Fuel Oil tank (Tank F06-1) as requested by the NYSDEC in a letter dated March 13, 1998. These wells are required as a condition of the Ravenswood Major Oil Storage Facility (MOSF) license.



Source: US Geological Survey 7.5-minute topographic map quadrangles for Central Park, NY-NJ (1966, photorevised 1979) and Brooklyn, NY (1967, photorevised 1979).

Scale: 1:24000

FOSTER WHEELER FOSTER WHEELER ENVIRONMENTAL CORPORATION	**Consolidated Edison Company of New York, Inc.** **Ravenswood Generating Station** **Exhibit 1-1** **Site Location Map**

1.1 PHASE II OBJECTIVES

The objectives for this investigation are to:

1) Provide information sufficient for Con Edison and potential buyers to fully understand the existing subsurface environmental conditions at Ravenswood and to be able to assess the level of effort required to achieve a No Further Action decision for the site; and

2) Respond to the requirements of the CO to investigate impacted areas associated with past oil spills identified in Appendix B of the CO that occurred at Ravenswood.

The primary goal of the investigation, which is central to achieving the investigation objectives, will be a programmatic approach to defining the efforts required to obtain a No Further Action decision for Ravenswood. Foster Wheeler Environmental's programmatic approach is to:

- Rapidly assess the effectiveness of the remedial actions conducted to date at the site through the review of existing environmental information that is available;
- Incorporate the results of the 1998 Phase I Environmental Assessment Report for the Ravenswood site;
- Develop this Site Investigation Work Plan to fill the gaps identified in the review of existing data; and
- Implement a field investigation to obtain data sufficient to determine the degree and extent of contamination, and for Con Edison and/or potential buyers to evaluate the actions required to move the site to closure.

This Work Plan describes a cost-effective approach to meeting the Phase II Site Investigation objectives consistent with the requirements of the CO. Details of our approach to this investigation are described within Section 3.0 of this Work Plan and major steps in the Phase II program are illustrated as a flow chart on Exhibit 1-2. The flow chart illustrates the major tasks consisting of Pre-planning, Work Plan Development, Implementation of Field Investigation, and Preparation of the Site Investigation Report (SIR), and if authorized by Con Edison, preparation of a Remedial Action Report (RAR). The flow chart in Exhibit 1-2 indicates that this Work Plan must be reviewed and approved by the NYSDEC. However, the schedule of the Con Edison's divestiture program requires that the Phase II site investigation proceeds immediately after review and approval of the Work Plan by Con Edison. Any comments that may be received from the NYSDEC will be incorporated into the work as the site investigation proceeds.

1.2 WORK PLAN APPROACH

The Work Plan presents a scope of work designed to fully meet the project objectives and complete the Phase II Investigation by adhering to safe work practices, and utilizing a cost-effective and streamlined approach.

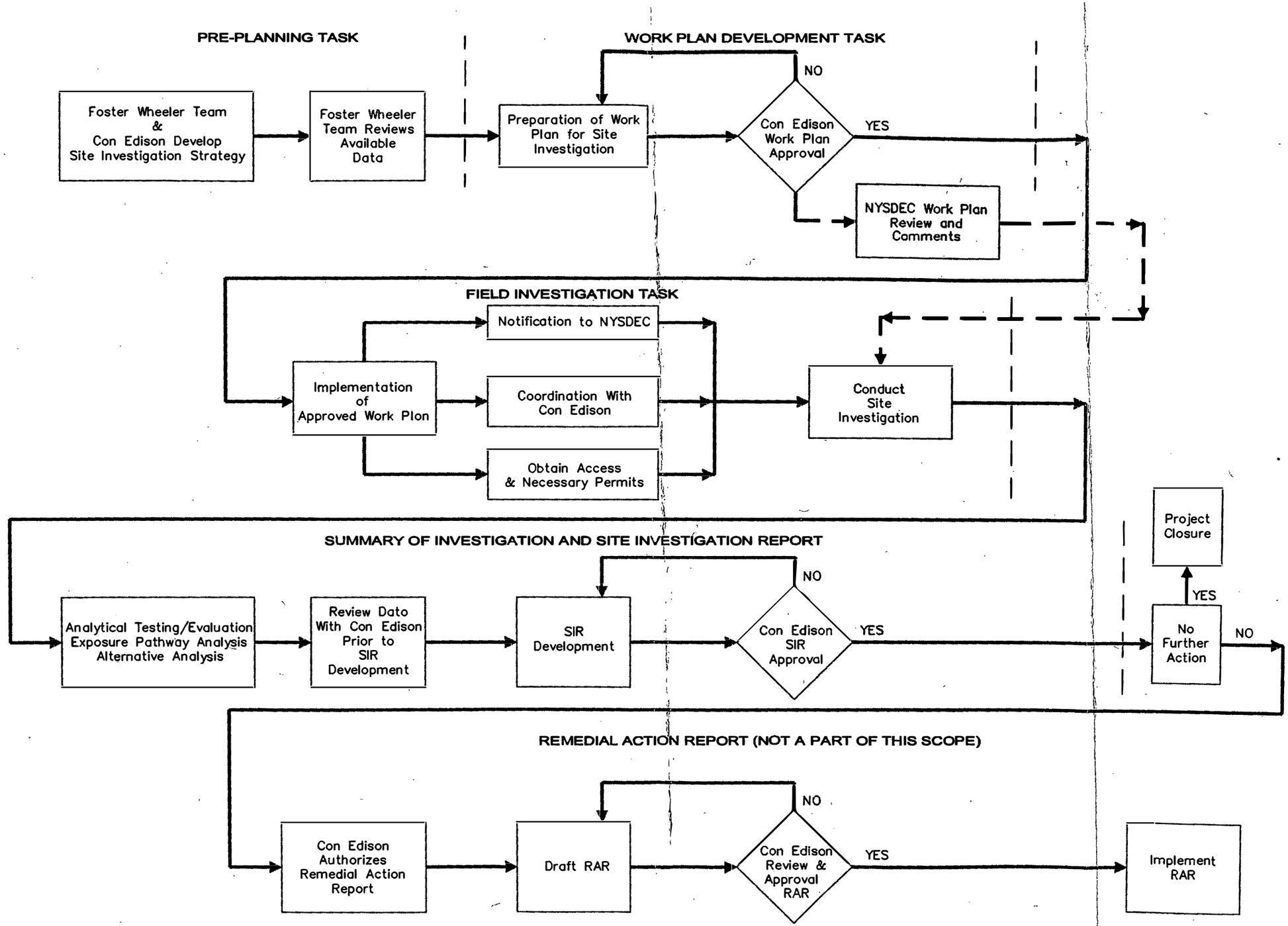


EXHIBIT 1-2

CAD FILE NAME: CON81998.DWG
PLOT SCALE: 1=1 (17x11)
DATE: 8/19/98
TIME: 3:00 PM

MGP-related environmental conditions to be investigated include the general operation areas former gas and coal tar process and handling facilities. The approach is to conduct a soil and ındwater investigation within and downgradient of the former MGP and spill areas that pro- sufficient information to determine the degree and extent of soil and groundwater impact ıciated with the past MGP operations and oil releases.

Appendix B environmental conditions to be investigated consist of six oil spills at Ravens- ɔd and one dielectric fluid release which occurred at the Vernon Central Substation located th of and adjacent to Ravenswood. The materials released included dielectric fluid, No. 6 fuel and/or unknown oil. The releases from the various structures or equipment occurred either ectly into the subsurface (soil), on to the surface or concrete surface, bluestone, and/or into the st River. Some of these releases most likely resulted in contamination of surface crushed ne and underlying site soils. These areas will be investigated by the collection and analysis of ar surface and subsurface soil samples to assess the degree and extent of impact to soil from se past releases.

s noted above, one of the primary objectives of this Site Investigation is to determine whether medial clean-up actions were previously performed in response to past spills and/or other re- ases at Ravenswood. In the event these remedial clean-up actions were not complete, then a te-specific exposure pathway and receptor evaluation will be used to assess any residual soil or oundwater impacts.

ı anticipation of a fast-track schedule for this project, Foster Wheeler Environmental has made se of its prior experience at this site and an adjacent site to evaluate potential impacts of the past pills and MGP site operations. Work already performed by Foster Wheeler Environmental at ıis site includes a Phase I Environmental Site Assessment and an ongoing Site Investigation at he adjoining Gas Turbine Facility and Rainey Substation Site. This work complements the ex- sting background information. Based on this experience, a detailed discussion and an evaluation ɔf environmental concerns identified above are presented in Section 2.2 of the Work Plan.

2.0 ENVIRONMENTAL SETTINGS

SITE CONDITIONS

Site Description

ɛnswood is located at 38-54 Vernon Boulevard, in Long Island City, Queens County, New ĸ. Ravenswood is situated on the eastern bank of the East River and is bordered by Con Edi- s Ravenswood Gas Turbine Facility to the north, Vernon Boulevard to the east, Con Edison's non Central Substation to the south, and the East River to the west. Exhibit 2-1 is a figure wing Ravenswood layout and identifies significant features to be investigated.

venswood is a secure, fenced complex that is continuously patrolled by security guards. The nerating Station at Ravenswood consists of three units which are housed in the main building the property. Generating Unit 1 was installed in 1961, and Generating Unit 2 was installed in 62. Generating Units 1 and 2 are rated at 400 megawatts (MW) and are designed to burn oil or tural gas. Generating Unit 3 installed in 1965 is rated at 1,000 MW, and is equipped with two ilers, designated as Boilers 30 north and south, which are designed to burn oil, natural gas, or al. Oil is the primary fuel used in the winter months, and natural gas is the primary fuel used in e summer months.

oal operations ceased at Ravenswood by 1974, however, remnants of the coal operations still ɛmain on-site along the East River, including three ash settling ponds, two ash silos, and the oal conveyor system. In addition, coal feeders, crushers, and hoppers remain inside the Gener- ting Station building.

n addition to the three steam-electric generating units, Con Edison operates a Steam Plant at Ravenswood. It is located in, so called, "Boiler House A", which is located adjacent to the East River, northwest of Generating Unit 3. The Boiler House A building was constructed in the late 1940s as a part of the former MGP (Exhibit 2-1). The Steam Plant utilizes four boilers to generate steam for the distribution to Con Edison's customers in Manhattan. Steam is delivered to Manhattan via a pipeline that passes through a Con Edison tunnel under the East River. The Steam Plant's boilers are designed to primarily burn No. 6 Fuel Oil but have a natural gas startup and limited burning capability as well. The Steam Plant utilizes a freshwater reservoir located to the north of the main Generating Station building and east of the Steam Plant. Water stored in this reservoir is used in the boilers to produce steam. The reservoir is a base of a former gas holder - a part of the MGP.

Fuel oil is supplied to Ravenswood from three tanks. The first tank is a mounded, completely covered, No. 6 fuel oil storage tank located east of the main Generating Station building, adjacent to Vernon Boulevard. The remaining two tanks are located at the Rainey Tank Farm on the Rainey Site located north of the subject site across 36th Ave.

Edison also maintains a marine transfer facility adjacent to the Steam Plant. This facility vides a berth for one semi-permanently berthed oil storage barge, the "Lemon Creek," which eased by Con Edison, and two separate berths for fuel oil delivery by barges. The "Lemon ek" barge is used for emergency storage only, and can currently store up to 60,000 barrels of The fuel oil can be pumped from the marine transfer facility to the Rainey Tank Farm, via ing which is primarily aboveground.

ldditional facilities located on Ravenswood include the Vernon Substation and the Tunnel adhouse buildings. The Vernon Central Substation, located in the southern portion of the Fa- ity, is supplied by Generating Units 1 and 2. The Tunnel Headhouse buildings were originally rt of the MGP operations located onsite. The tunnels connect Ravenswood to Manhattan and e used for the transmission of steam and power. One satellite gas turbine is located to the outheastern corner of the main Generating Station building and is used for the "black" startup apability of the Ravenswood Generating Station.

he area in the northern portion of Ravenswood was initially an MGP facility, as early as 1898. n the late 1950s, most of the MGP facility structures were demolished, and the current Generat- ng Station buildings were constructed by the early 1960s. Exhibit 2-1 indicates the location of ormer MGP structures of potential environmental significance.

2.1.2 Surface Conditions

The surface topography of the site is relatively flat with a gentle slope from east to west across the site. Surface elevations range from approximately +20 feet to +10 feet above mean sea level (MSL). Lower elevations are along the western property boundary, adjacent to the East River. Surface water run off is generally from east to west towards the East River except where obstructed generating buildings. The generating buildings represent an obstruction to this general east west flow direction. In areas with stone cover, surface water is able to percolate to the ground. Some portions of the Ravenswood site contain a storm drainage system that conveys surface runoff directly to the East River.

The ground surface is covered with concrete and/or asphalt in some areas onsite; however, a significant portion of the site is covered with chucked stone (bluestone). In areas that contain electrical equipment, the ground surface is covered with a layer of bluestone. In some areas, the bluestone surface layer is reported to be as much as 2 to 3 feet thick before encountering the fill material (unconsolidated).

2.1.3 Subsurface Conditions

The Phase II Site Investigation will focus on the specific spill release areas and the former MGP structures. To delineate the extent of any residual contamination requires an understanding of the site subsurface conditions. The subsurface geologic and manmade structures (e.g., utilities, MGP structures, etc. and their associated backfill material) can provide pathways for the migration of the contaminants through the subsurface. Likewise, subsurface concrete foundations and the

ead sheet piling can serve as barriers to groundwater and contaminant migration. If the in-
ce of these migration pathways is characterized, then a determination on the presence and/or
t of contaminants in the subsurface can be made, with the intent of assessing the signifi-
: of any residual contamination and understanding the effort required for a No Further Ac-
determination at Ravenswood. Foster Wheeler Environmental will direct its investigative
ities with an interpretation of contaminant migration that incorporates potential influences of
made conduits or barriers on the subsurface geologic materials and water-bearing unit. Dur-
)ur investigation of known spill and potential release areas, we will consider the influence of
urface conduits that are expected to pass through these spill areas.

erally, the soil profile consists of fill forming the upper-most stratum underlain by fine to
lium, brown to gray sand with various amounts of silt and on top of bedrock. The surficial fill
erial are reported to consist of coarse to fine sand with various amounts of gravel and silt.
: unconsolidated deposits range in thickness from approximately 6 to 27 along the eastern site
its to as much as 35 feet along the western site limit adjacent to the East River.

drogeologic information from test borings in the vicinity of "Boiler House A", indicate the
ter table is located at an elevation of approximately 8 to 9 feet below ground surface (bgs) de-
ıding on tidal fluctuations. According to the Ravenswood Generating Station Groundwater
)ntingency Plan, contained in the Spill Prevention Control and Countermeasure (SPCC) Plan,
ted April 1997, water elevations from boring locations around the mounded No. 6 tank located
the southeastern portion of the property averaged 10.3 feet below grade. These elevations cor-
spond to a water table in the overburden. Based on the local topography, drill log data, and the
ose proximity of the East River, the overall site groundwater flow direction is estimated to be
wards the East River. Actual localized flow paths can be influenced or controlled by the bed-
)ck surface and subsurface structures, which extend in many cases to the top of the bedrock sur-
ıce. The site drawings indicate that the area beneath Unit Nos. 1, 2, and 3 were to be excavated
) the top of the bedrock prior to construction. Groundwater from the overburden discharges
rimarily to the East River. Therefore, monitoring wells need to be spaced and positioned ac-
ordingly to provide sampling points that can be issued to evaluate water quality up and down-
;radient of the former MGP structures and for the collection of representative water table eleva-
ions. From these data, the groundwater flow direction and gradient, groundwater discharge ca-
)acity, and the affect of subsurface structures on groundwater flow can be evaluated.

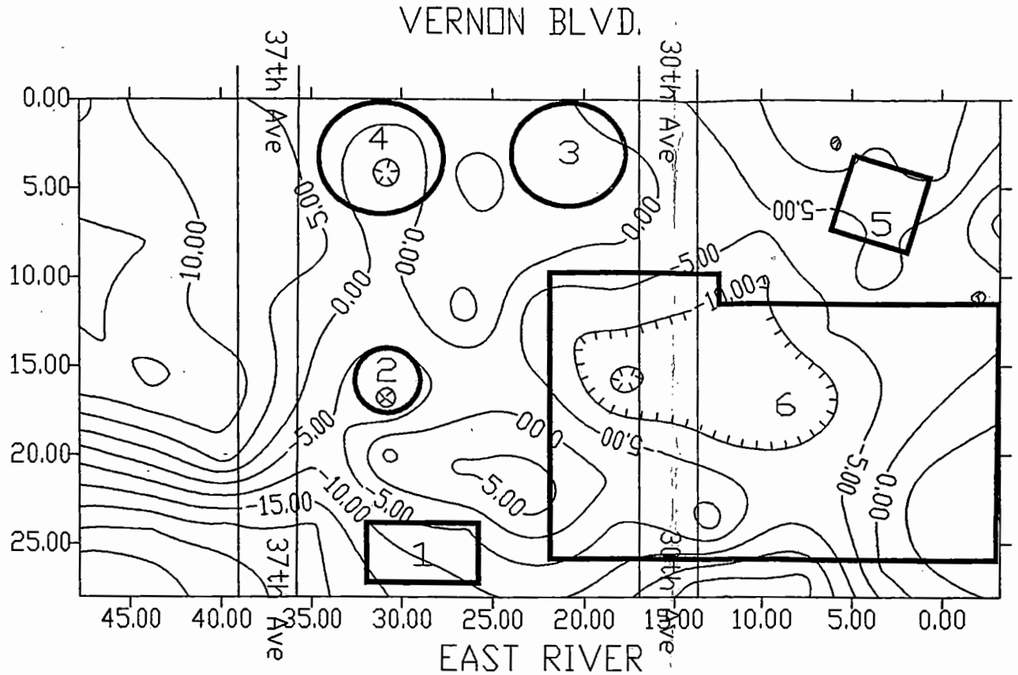
Based on their composition, the contaminants of concern may have migrated vertically down-
vard until reaching a less permeable layer such as the bedrock unit. Based on published infor-
nation it is anticipated that the bedrock beneath the site will have a permeability an order of
nagnitude or more lower than the overburden soils.

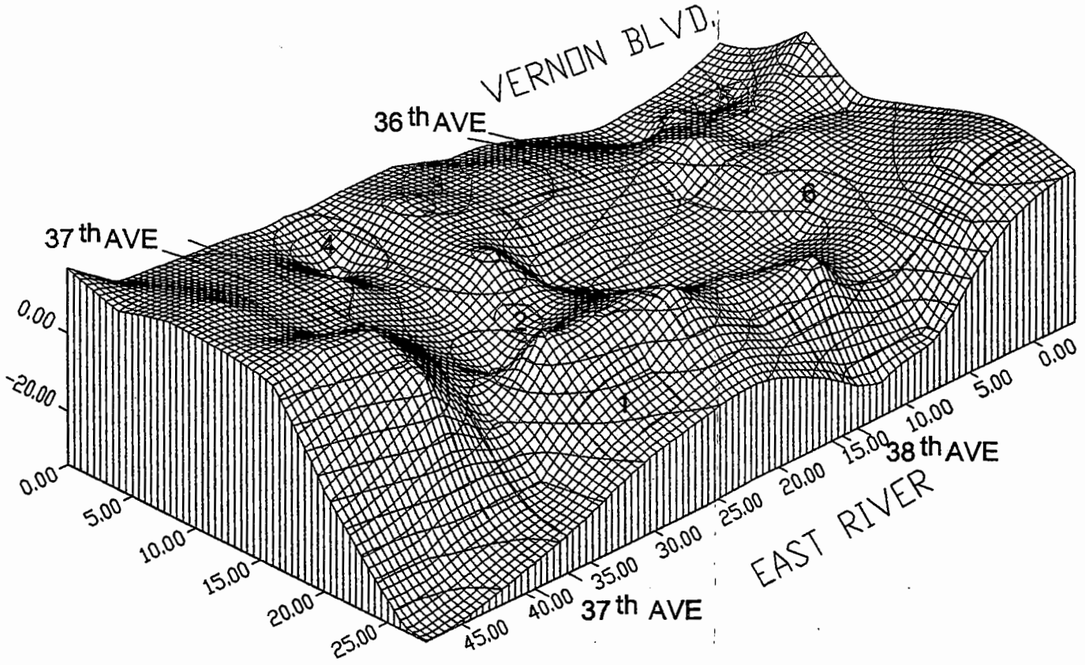
The Geologic Map of New York, Lower Hudson Sheet (Fisher et al, 1970, reprinted, 1995, NYS
Museum and Science Service Map and Chart Series No.15), indicates a ridge is formed beneath
he site area by the Ravenswood Gneiss, which is a biotite-hornblende-quartz-plagioclase gneiss
with accessory garnet and sphene. This unit strikes northeastward and also outcrops near Long

nd Sound in Westchester County, New York and Connecticut where it is known as the Harri- Gneiss and the Brookfield Diorite Gneiss. According to the Ravenswood Generating Station)undwater Contingency Plan, dated April 1997, Ravenswood is underlain by the Harrison eiss Formation. This formation parallels the East River, extending from the lower east side of .nhattan to Hunters Point, Queens, south of Ravenswood, to Pot Cove, north of Ravenswood.

e slope of the bedrock is anticipated to vary significantly across the site with high elevation at ;tern site limits and lower elevation typically above the western limit. However, elevations of : bedrock at positions on the interior of the site can vary significantly from the anticipated nd. Using historical soil boring data a 3D bedrock surface structural map was created and is :sented as Exhibit 2-2. The map covers the area from the southern limit of power generating ıit 1 to the northern edge of the Con Edison Ravenswood Generating Station property. Exhibit 2 presents a view looking southwest from the northwest corner of the property, south of the ounded No. 6 tank. Exhibit 2-2 also presents a plan view of bedrock surface. Two views were ovided because the top of the bedrock surface has several depressions within the site that can)t be fully viewed in the 3-D image. The Exhibit 2-2 figures are intended to provide a general presentation of the bedrock surface indicating areas of higher and lower bedrock elevation :lative to one another within the site. Exhibit 2-2 indicates that the top of bedrock elevations ary widely across the site with local highs and depression elevations range from +5 feet to -35 :et MSL. The general overall slope appear to be to the west. The topography of the top of the edrock surface may be a significant factor in the migration of contaminants. This may be a actor on the eastern portion's of the site where a thin water table will follow the bedrock topog- aphy. Also, if DNAPL is present its migration may ultimately be controlled by the bedrock sur- ace beneath the site where bedrock depressions could serve local collection point for DNAPL. Also illustrated on Exhibit 2-2 are some of the identifying site features including 37 and 38 Ave- ıues, the Ravenswood generating units, and the Freshwater Reservoir, the former gas holder 3 ınd 4 and the No. 6 fuel oil tank. Based on the locations of these features, and the top of the bed- ·ock surface, potential migration pathways can be interpreted. Based on these pathways, the ;ampling locations in Exhibit 2-1 have been placed to access these conditions.

The Groundwater Contingency Plans provided in the SPCC Plan, reference a USGS Publication (File Report 81-1186) which characterize the underlying bedrock at the property as having a low hydraulic conductivity formation that does not yield more than a few gallons per minute of water. This is typical and expected for the type of bedrock identified at the site. Under these conditions the quantity of water that can flow vertically downward across the bedrock boundary will be insignificant and groundwater will preferentially flow in the overlying unconsolidated deposits to discharge in the East River. The USG further characterize the bedrock surface is considered to be the bottom hydrologic boundary for the site groundwater flow system. The top of the bedrock surface has been defined as it may be a potential migration pathway. This Work Plan presents a program to investigate the unconsolidated material above the bedrock to assess the environmental conditions at the site.





LEGEND

1 - Boiler House 'A'
2 - Fresh Water Reservoir
3 - No. 3 Gas Holder
4 - No. 4 Gas Holder
5 - No. 6 Fuel Oil Tank
6 - Power Generation Units 1, 2, and 3

DRAFT

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE IT MANUALLY

CON EDISON

RAVENSWOOD GENERATING STATION

EXHIBIT 2-2

BEDROCK SURFACE STRUCTURAL MAP

FOSTER WHEELER ENVIRONMENTAL CORPORATION
LIVINGSTON, NEW JERSEY

CAD FILE NAME: RA72498A.DWG DATE: 8/19/98
PLOT SCALE: 1=1 TIME: 8:55 AM

1.4 Chemicals of Interest

ıe potential chemicals of interest (COI) on the Ravenswood Facility include dielectric fluid, ɔ. 6 fuel oil, transformer oil, PCBs, and MGP site wastes. Material Safety Data Sheets ISDS) for dielectric fluid used at Ravenswood contain synthetic polymers that pose little risk human health or the environment.

2.2 PRE-PLANNING

rior to the preparation of this Work Plan, Foster Wheeler Environmental implemented a thor-ıgh pre-planning task. During this period, Con Edison and Foster Wheeler Environmental ex-ıanged available data/information to facilitate the development of a sound, comprehensive Vork Plan. In preparation of the Site Investigation Work Plan, Foster Wheeler Environmental ɛviewed the following available information:

- The Phase I Site Assessment Report;
- Soil Boring Logs from Across the Site;
- The Draft Environmental Impact Statement for Coal Conversion at Ravenswood Generating Station Unit 3 dated March 1982;
- Spill reports from the NYSDEC and Con Edison;
- Discharge Monitoring Reports (DMR);
- SPDES Permit;
- Waterfront Development Plans, and Engineering Drawings;
- Subsurface Utility (i.e., electrical, sewer, fire protection, oil, etc.) Drawings;
- Sanborn Maps; and
- Historical Aerial Photographs.

The Pre-Planning task has provided information sufficient to identify and preliminarily characterize the site environmental impacts as well describe the history and nature of the identified environmental concerns at Ravenswood. The following discussion presents a review of the Pre-Planning efforts.

2.2.1 Environmental Impacts

Site history indicates that Con Edison previously undertook remedial action, addressing the significant CO Appendix B spills on the site. This proactive approach was successful in limiting the potential impacts to surface and subsurface soils, the underlying groundwater, and the East River. This Phase II evaluation of the nature and extent of the impacts from past MGP operations, the CO Appendix B spill residuals and impacts from the transformer oil releases is required for Con Edison and potential buyers of Ravenswood to fully appreciate the environmental conditions of the Facility and to address the requirements of the NYSDEC CO. Foster Wheeler Environmental anticipates impacts from reported spills and the former MGP operations to be more of an envi-

ımental concern than a human health concern. This is based on the following key environ-
ɜntal factors:

- The groundwater in the vicinity of Ravenswood is not used for potable purposes, or for industrial/commercial water supply. According to the Groundwater Contingency Plans provided in the SPCC Plan, groundwater in the area is classified by NYSDEC as Class GSA groundwater and is best used as a source of potable mineral water for conversion to fresh potable water. Groundwater in the vicinity of the property is not used for either potable or non-potable purposes. The nearest wells are at least five miles inland to the south and east of Ravenswood while groundwater at the Ravenswood Site generally flows to the west and discharges to the East River. Near the shoreline of the property, the groundwater probably would not be suitable for domestic and most other uses because of the high chloride concentrations due to saltwater intrusion. The vast majority of the water for public use is obtained from the upstate reservoirs of the New York City water system.
- The dermal exposure pathway is limited due to the site cover and the potential depth of contamination (if present, is not anticipated to be near surface).
- The risk of exposure to contaminants, if present in the subsurface, can be mitigated through implementation of the Environmental Health and Safety Plan (EHS Plan) (e.g., instrument monitoring, adequate personal protective equipment (PPE), risk avoidance, and adherence to the electrical facility maintenance standards).

ı order to understand the environmental conditions, potential impacts at the site and prepare a ost effective field program, Foster Wheeler Environmental has reviewed and evaluated the for-
ıer MGP site historical data, the seven CO Appendix B spills, and the bluestone and soil con-
amination in the vicinity of the generator transformers. The facts and preliminary evaluation of
ach are outlined below.

².2.2 Former Manufactured Gas Plant Site

Facts. Before 1898 to the late 1950s, buildings and structures relating to MGP operations ex-
sted on the northern portion of the Ravenswood Generating Station. These buildings and struc-
ures included the No. 2 Gas Holder (100 ft. diameter), No. 3 Gas Holder (190 ft. diameter), No.
4 Gas Holder (190 ft. diameter), a fresh water reservoir which was formerly a gas holder, a Puri-
fier House and boxes (24), two tar separators, Generator Houses "A" and "B", Boiler Houses "A"
and "B", an Engine House, Wash House and Exhaust House, tar and oil tanks, condensers and
other miscellaneous structures. These former MGP buildings and structures are shown in Exhibit
2-1. Types of MGP operations which may have existed include Coal (Retort) Carbonization and
Carburetted Water Gas Production. During the Coal (Retort) Carbonization process, coal was
carbonized in ovens (retorts). In order to adequately investigate a former MGP site, an under-
standing of the on-site MGP process is needed. Once the process, the location of structures and
equipment, and their residual production is identified, then an adequate sampling program can be
designed and implemented to cost-effectively investigate the MGP site. The location and analy-
ses of a sampling point is dependent on this evaluation.

›resent Steam Plant building, presented in Exhibit 2-1, was built in the late 1940s, based on iew of the available Sanborn maps, and was originally denoted as Boiler House "A". As 'n in the historic map of the MGP plant, and noted on Exhibit 2-1 generator buildings, de- l as Generator House "A" and Generator House "B," another boiler house (Boiler House , and an Engine House building were located southeast of Boiler House "A." To the east of ɛr House "A" and north of the generators was the tar separator. A water reservoir (which is present on the Facility site) and the purifier house were located further to the east on the site. water reservoir was originally built to be a gas holder, Gas Holder No. 1 and was converted s present use between 1915 and 1936, based on a review of the available Sanborn fire insur- : maps. Three above gas holders, depicted on Exhibit 2-1 as Gas Holders Nos. 2, 3, and 4 l to be located in the northeastern portion of the site. Based on a review of the available San- ı maps, holders No. 2 and 3 were built before 1898, and holder No. 4 was built before 1915. ɜently, the area where the former holders were located is a large parking lot.

indicated on Exhibit 2-1 MGP structures on the southern portion of the property included nine ›veground storage tanks for tar, fuel oil and transformer oil (Former Tar Tanks), an above- und storage tank for gas oil, (No. 56 storage tanks) and a mounded storage tank for fuel oil ınk F06-3). The mounded fuel oil tank (Tank F06-3 on Exhibit 2-1) still exists at the site. Tar ›arator tanks were located in the central portion of this area, to the west of the fuel tanks, ac- :ding to Exhibit 2-1, across 38th Avenue from the Purifier House.

eliminary Evaluation. A majority of the former MGP buildings and structures have been de- ɔlished and therefore are not currently visible on-site. The fresh water reservoir, the Boiler ɔuse "A" and the mounded fuel oil tank are intact and visible at the site. The area of a number the former MGP buildings and structures, including portions of the Purifier House and boxes, tar tank, a tar separator, Generator Building "B", Engine House, and Boiler House "B", is now :cupied by Generating Unit #3, Boiler #30. Existing information indicates that the area of the :isting generating station was excavated to and below bedrock surface shown in Exhibit 2-2. herefore the former MGP structures and associated materials in this area were removed as part f the generator and structures in 1960.

oster Wheeler Environmental also reviewed the Inventory Work Sheet Detail Sketches of the Gas Holder Nos. 2, 3, and 4. Table 2-1 provides some of the details.

Table 2-1
Gas Holder Details

Holder No.	Date of Details	Original Elevation of Ground Surface (ft MSL)	Elevation of Bottom Holder Foundation (ft MSL)	Elevation of Bottom of Outlets (ft MSL)	Original Rock Elevation	Approx. Current Elevation of Ground Surface (ft MSL)
2	7/2/1936	NA	2 ft. below grade	7 ft. below grade	NA	14
3	7/7/1936	6.5	1.916	-2.0	NA	15.8
4	6/25/1936	9.42-11.50	0.0	-6.5	4.92	15

IA - Not Available

ed on the data provided in the Inventory Work Sheet Detail and as also outlined in Table 2-1, gas holders and associated piping were constructed below grade and sit below the top of the rock surface shown in Exhibit 2-2. The base of the holders consisted of a concrete founda- with inlet and outlet pipes which measured approximately 36 inches in diameter and were ated below the concrete foundation. The steel tank (gas holders) were set on the concrete ndation and extended above grade.

eview of Table 2-1 also indicates that approximately 9 and 4.5 feet of fill material have been led on top of the original ground surface at former Gas Holder Nos. 3 and 4, respectively. In lition, the depth from the current ground surface elevation to the elevation of the bottom lder foundation is approximately 13.8 and 15 feet, respectively for Gas Holders Nos. 3 and 4. cause these holders were constructed below the bedrock surface and are therefore depressions the bedrock surface, any contaminants that may have migrated outside of these structures and o the surrounding fill may have collected in these low areas in the bedrock. In addition, based Foster Wheeler Environmental's experience at former MGP sites, the investigation of the lder walls is also necessary. Inspection of these walls provides information on the integrity of e structure, whether contaminants have migrated outside the holder and whether tar is trapped tween the holder walls. Tar was commonly used as a sealant between holder walls to trap gas om escaping from the holder.

he purifier house and boxes are also suspected areas of concern on a former MGP site. The anufactured gas was passed through wood chips and iron oxide trays in order to remove impu- ities. Therefore, sulfur and cyanide are commonly associated with this area of MGP operation.

he remaining areas to be investigated as part of the former MGP site include tar wells and anks, tar separators and condensers, and oil tanks. These structures were used to store tars gener- ated from the process and oil to be used in the manufacturing process. Commonly, when former MGP operations were closed, the structures and buildings were demolished, and residual materi- als left inside and not removed or disposed of. These areas have in many cases become the "source" of contaminants which commonly migrate from the areas of the former structures and are later detected in the subsurface soils and groundwater. As part of this Phase II these areas will be investigated and evaluated.

2.2.3 Oil Spills Identified in Appendix B of November 1994 Consent Order

Item 1: DEC Spill No. 9311706

Facts. On January 1, 1994, an open-ended 1/2-inch fuel oil heater discharged an unknown volume of No. 6 fuel oil onto a soil area near the "06" Fuel Oil Tank. The spill covered an area approximately 50 feet by 50 feet in size. The released oil congealed and was recovered. No sewer or waterway was affected by this spill.

Preliminary Evaluation. Based on Foster Wheeler Environmental's evaluation of the data available, Con Edison's contractor remediated the soils impacted by the spill and No Further Action

nould be required. However, soil samples need to be collected and analyzed to docu-ıent/support a No Further Action determination for this spill.

tem 2: DEC Spill No. 9414394

'acts. On July 12, 1994, an internal leak on a fuel oil heater caused a spill of approximately 100 ;allons of No. 6 fuel oil onto a concrete floor in the Station's basement. The released product lid not reach soil, sewer, or waterway structures, the present Steam Plant building in the north-:astern portion, or parking lots.

'reliminary Evaluation. Based on data available, it appears that the No. 6 fuel oil was recov-:red from the concrete floor in the Station's basement by Miller Environmental (MEG). Because he release appears to have been confined to the basement floor, an inspection of the floor should ɔe made to confirm no potential migration pathway exists and a conclusion can then be made that No Further Action for this spill is required.

Item 3: DEC Spill No. 9406019

Facts. On August 2, 1994, the United States Coast Guard (USCG) personnel discovered an oil sheen of unknown origin and type in the East River at a common outfall from the Station. It was not possible to determine the source or amount of the spill. The oil sheen, which was removed by a Con Edison cleanup contractor, caused no environmental damage.

Preliminary Evaluation. Based on the discovery of the oil sheen on August 2, 1994, the sheen has since dissipated in the East River. Therefore, No Further Action should be required and the spill should be closed out.

Item 4: DEC Spill No. 9407884

Facts. On September 13, 1994, test borings conducted near the Boiler House "A" indicated the presence of oil-contaminated soil. The source of this contamination was not determined at that time, however, it should be noted that oil and coal tar storage facilities associated with the former MGP operations were located in the vicinity of Boiler House "A."

According to the soil boring logs prepared by Jersey Boring & Drilling Co. Inc., three soil borings were drilled. Split-spoon samples were collected at 5-foot intervals. The soil descriptions indicate "sand soaked in fuel oil" at depths ranging from 10 to 35 feet bgs.

Preliminary Evaluation. Foster Wheeler Environmental has reviewed the three test boring logs drilled in the vicinity of Boiler House "A". Based on the logs, it appears that the oil is migrating along the top of the water table surface. A review of test boring log B-2 indicates that fuel oil was detected at approximately 5 feet bgs. Of all locations, B-2 is the only location where fuel oil was detected above the water table. Therefore, the source of this material may be in the immediate vicinity of B-2. Also, based on the geology in this area, subsurface conditions are favorable for the vertical migration of a light weight oil from the ground surface to intercept the water table

surface. As identified in the test logs, the oil has continued to migrate vertically below the water able surface. This was concluded in the Hydrogeologic Survey for the Ravenswood Generating Station dated January 1991. Therefore, it is possible that the source of this material may have been a historic release or associated with the former MGP operations.

During the Work Plan preparation process, the location of each test boring log has been identified. Based on their locations, a cost-effective sampling program can be designed for this release. Additional test borings and monitoring wells are planned in this area to delineate the release, to determine whether a Light Non-Aqueous Phase Liquid (LNAPL) is present and to determine the groundwater quality at this location on-site.

Item 5: DEC Spill No. 9300948

Facts. On April 20, 1993, approximately 110 gallons of dielectric fluid (cable oil) was released from a blown pot head onto bluestone within the Vernon Central Substation located south of the Generating Station at the Ravenswood Facility. The released oil was first contained by the Substation personnel, and the entire spill was then cleaned by an outside Con Edison contractor.

Preliminary Evaluation. Approximately 110 gallons of dielectric fluid was released. A review of the NYSDEC Spill Report Form identifies that a total of 50 gallons of non-PCB feeder oil was released and zero gallons was recovered. Based on information provided by Con Edison, remediation of this area has been completed.

In order to obtain a No Further Action for this spill, and close out the spill, subsurface soil samples need to be collected/analyzed in this area. Two samples will be collected, the first, immediately beneath the depth to which impacted soils/bluestone were excavated, and the second at the soil/water interface.

Item 6: DEC Spill No. 9411975

Facts. On December 7, 1994, an underground pipeline carrying No. 6 fuel oil ruptured approximately 10 feet below grade in the Station parking lot south of the 37th Avenue entrance. The release was due to a failure of an insulating joint on the fuel oil pipeline. The NYSDEC Spill Report Form indicates that 39,580 gallons of No. 6 fuel oil were spilled and no fuel oil was recovered. The form also indicated that Con Edison personnel contained the release. Con Edison retained MEG to perform and document in a report cleanup of the spill. According to MEG's report, an estimated 39,000 gallons of free product were released during this incident. From the initial release point, the No. 6 fuel oil flowed in two separate directions: west, towards the East River, into an area covered with bluestone gravel, and south into an adjacent area also covered with bluestone gravel. The oil was contained at all times within the boundaries of the Ravenswood property, and was prevented from reaching the East River by absorbent material. No release of oil into sewers occurred. Approximately 19,560 gallons of free product were recovered, 69,320 gallons of an oil/water mixture were removed and disposed of, and a total of 1,690 cubic yards of contaminated soil and other solids were also removed and disposed of.

According to MEG's report, 34 soil borings were advanced in the area of the spill while the cleanup operations for this spill were in progress, to determine if oil was present under the asphalt of the parking lot. Each soil boring was completed to a maximum depth of two feet bgs, and fuel oil was not observed in any of the 34 soil borings. Based on the subsurface investigation and observations of oil seeping from cracks in the asphalt, a decision was made to remove asphalt in the areas where oil had seeped. An area measuring approximately 100 feet by 120 feet of asphalt-covered parking lot was removed.

Once the asphalt was removed, a sampling grid with 20-foot intervals was established in the immediate vicinity of the fuel line rupture, and a total of 22 sampling locations were selected. The samples were collected at the ground surface and directly below any loose gravel/blend material which may have been present. The soil samples were analyzed for total petroleum hydrocarbons (TPH), and the results ranged from 3.5 parts per million (ppm) to 295,000 ppm. In addition, an area located southwest of the fuel line rupture, where fuel oil had pooled during the spill, also was sampled. A limited amount of asphalt was removed from this area, and oil-soaked soil was removed to a depth of approximately three feet bgs. Five soil samples were collected and analyzed for TPH, and the results ranged from 12.9 to 55.3 ppm.

The report prepared by MEG recommended that several tasks be conducted, after the completion of the emergency phase of the spill cleanup. These recommendations included:

- Vaults and drywells should be re-evaluated for further cleaning or oil removal.
- The area along the fence, southwest of the fuel line rupture, requires additional work since oil was still present.
- One monitoring well should be installed at the excavation location.

These recommendations have not been implemented by Con Edison.

Preliminary Evaluation. Foster Wheeler Environmental has reviewed the Limited Subsurface Investigation Report and the Ravenswood Generating Station Spill Report prepared by MEG dated December 1994 and March 3, 1995, respectively, and the NYSDEC Spill Report Form. Based on this information, additional sampling of the subsurface soils is needed below the excavated material down to the water table to determine if this release has reached the water table. Based on the available data, soil sampling (SB-6 on Exhibit 2-1) will be performed in the vicinity of S-11 and S-15, which exhibited the highest TPH concentrations, 19,000 and 295,000 ppm, respectively.

Item 7: DEC Spill No. Not Available

Facts. On seven occasions, February 20 and 27, 1996; March 5, 13, 15, and 26, 1996; and April 10, 1996, the Station personnel observed and reported an oil sheen in the East River. On April 18, 1996, Con Edison submitted a letter to the United States Environmental Protection Agency (USEPA) regarding seven oil sheens which were reported in the East River during a 60-day period. The source of the sheen was unknown, and no spills or leaks from Station equipment oc-

In all of these incidents, the sheen was contained within a permanent containment boom eployed at the Station. In each case, the oil sheen was removed using oil absorbent mate- here were no known oil leaks or spills within the Station, and the source of the reoccur- een was undetermined. For this reason, the Station conducted dye testing and discovered oil-water separator located in Boiler House "A," which was believed to discharge to the ork City sewer system, in fact was actually discharging to the East River. After that dis- , Con Edison had the effluent from this oil-water separator rerouted into the sewer, and the rough which the separator effluent used to discharge to the East River was cleaned and inspected. The pipe was found to be in deteriorated condition; it was concluded that debris pipe and/or ground leakage into the pipe was potential sources of the oil sheen observed in

ninary Evaluation. Based on the location of these releases in the area of the former MGP tions, soil borings and monitoring wells have been proposed and will be utilized to investi- he former MGP operations and also will provide information to address these releases.

Bluestone and Soil Contamination in Vicinity of Generator Transformers

s. As per the Phase I Environmental Site Assessment Report, the Summary for the Ravens- d Generating Station indicates that during removal and replacement of Transformer 1E, lo- d immediately south of Unit 1, oily soil containing PCBs was found beneath the transform- A replacement for Transformer 1W is currently on order, and Con Edison intends to investi- : and remediate both transformer areas once Transformer 1 West has been replaced. The ex- : of oil/PCB contamination in this area is not currently known. The vaults under the trans- mer are reported to extend to approximately 20 feet bgs. Staining of the bluestone underneath nsformer 1E was noted during the Phase I site reconnaissance. According to the Ravenswood nerating Station's Major Oil Storage Facility (MOSF) Report System, Oil Spills Database, ted December 31, 1997, the bushing on Generator Transformer 3S faulted on October 10, 97, causing a fire. Pieces of the failed bushing damaged one of the transformer's fins, result- g in an approximately 200 gallon leak of non-PCB transformer oil onto the bluestone area be- ath the transformer. According to the Spill Database, the oil has been documented to have less n 10 ppm PCBs, and the oil leak was isolated to the transformer bay. Samples of the oil were llected from the failed bushing, and tested to be non-PCB oil. Staining of the bluestone under- ath the transformer was noted during the Phase I site reconnaissance. The extent of oil con- nination resulting from this leak is not known. During the pre-bid site visit the Con Edison oject Manager indicated that Transformers 1W and 3N are to be included in the investigation. e site investigation in the vicinity of Generator Transformer 1E and 1W is to determine the tent of oil and PCB contamination in bluestone and underlying soil and whether PCBs reached oundwater at that location. The field investigation at Generator Transformer 3S is to determine e extent of oil contamination in bluestone and underlying soil; the potential presence of PCBs this location shall also be investigated.

Preliminary Evaluation. Foster Wheeler Environmental reviewed the available information associated with these releases in the vicinity of Generator Transformers 1E, 1W, 3N and 3S. Table 2-2 also outlines the results of the analytical testing performed in these areas.

Table 2-2
Analytical Testing Results
Vicinity of Generator Transformers

Location	Media	PCB Results (ppm)
TR 1E	Bluestone	<1.0
TR 1E	Soil	<1.0
TR 3N	Soil	<1.0
TR 3N	Soil	2
TR 3N	Oil	<1.0

Based on this information, additional soil samples will be collected and analyzed in the apparent downgradient location.

2.3 SANBORN MAPS AND AERIAL PHOTOS

As part of the Phase I Assessment, Foster Wheeler Environmental obtained historical aerial photographs of the site dating back to 1954, Sanborn maps of the property dating back to 1898, and NYSDEC spill reports. Copies of the photos and maps are provided in the Phase I Report. The discussion of these taken from in the Phase I Report is provided below.

Sanborn Maps. Foster Wheeler Environmental obtained and reviewed a total of 13 Sanborn maps of the property and the area surrounding the site.

The 1898 Sanborn fire insurance map indicates that the Ravenswood Generating Station property was divided between the East River Gas Light Company, a MGP facility, and Wm. J. Matheson & Company, which produced color pigments. Throughout the early 1900s and up to at least 1950, the northern portion of the Station property was used for MGP operations. Structures present included buildings, gas holders, tar wells, oil storage tanks, and a coal pile. Con Edison was denoted as the owner of the northern portion of the property on the 1947 Sanborn map, and continued the MGP operations as shown on the 1947 and 1950 maps.

Process buildings were present on the southern portion of the Station property for the Matheson Lead Company, a white lead works plant, in 1915. In addition, from 1915 through at least 1941, a stone works, Wm. Bradley & Son Stone Works, was built. By 1936, the southern portion of the Station property also included the Forest Trim Mills/Forest Box & Lumber Company. This operation included a box making building, a planing mill, a woodworking building, and lumber storage. The current Ravenswood Generating Station, including the main generating building and boiler house building, is present on the 1980 Sanborn, and the Station property remains relatively unchanged in the maps for 1991, 1992, 1993, 1994, 1995, and 1996.

ıe Ravenswood Gas Turbine Facility property was originally residential housing, with a school ıd fire engine company, according to the 1898 Sanborn map. By 1915, the area had become dustrialized, with process buildings for a glass bottle manufacturer, Bottlers & Manufacturers ıpply Company, and two marble companies, Chrs. M. Gray Marble & State Company and The raitel Marble Company. An asphalt paving plant and building materials supplier were added to ıe property area by 1936. According to the 1947 Sanborn map, the bottle manufacturing company was no longer present on the property. A.J. Mainzer Inc., a food processing and food products company, and Cereal Products, a corn syrup manufacturer, now occupied a portion of the resent Ravenswood Facility site. By 1980, Con Edison had become the property owner. The resent Ravenswood Gas Turbine Facility operations, i.e., the buildings, turbines, and oil tank, ıad been built, and continued relatively unchanged through the 1990s.

ıerial Photographs. Foster Wheeler Environmental obtained and reviewed five historical aerial ıhotographs of the property. The photographs were taken on March 23, 1954, April 12, 1961, April 12, 1976, March 3, 1980, and March 27, 1996.

In 1954, the northern portion of the Ravenswood Generating Station was covered by buildings and structures related to the former Manufactured Gas Plant facilities. Two large gas holders and one smaller gas holder were present on the northeastern portion of the property. Buildings visible on the property include the purifier house, the generator house, and the boiler house, as named in the 1950 Sanborn fire insurance map. The southern portion of the present Ravenswood Generating Station, on the south side of the visible roadway from the MGP facility, contained a tank and a mound, which, according to the Sanborn map for 1950, was a mounded fuel oil tank, and associated buildings. To the north, on the present Ravenswood Gas Turbine Facility, lie a roadway and buildings, which according to the 1950 Sanborn map, were for a food processing company. Also visible to the north is the roadway and beginnings of the bridge to Roosevelt Island and additional buildings. The property across 36th Avenue which will become the Rainey Tank Farm included buildings and undeveloped areas. To the south of the Ravenswood Generating Station are several buildings, noted as a box and lumber company as per the 1950 Sanborn map.

By 1961, most of the buildings and structures related to the former MGP facilities, with the exception of the Boiler House "A" building and the water reservoir, had been demolished and the property area cleared. Visible in the aerial photograph is the construction of the foundation walls for a portion of the Station's Discharge Tunnel. In addition, many of the buildings to the north, the food processing company, and to the south, the box and lumber company, had also been razed. Buildings still occupy the eastern portion of the area across 36th Street to the north of the Ravenswood Gas Turbine Facility property, which will become the Rainey Tank Farm. The bridge to Roosevelt Island, to the north, had been finished by 1961. A park was built to the south-southwest of the Station property.

The 1976 aerial photograph indicates many changes have occurred at the properties. At this time, the main Ravenswood Generating Station building had been built. Surrounding the build-

ing are various support structures, the present Steam Plant building in the northeastern portion, and parking lots. In addition, the water reservoir is visible in the center of the northern portion of the Ravenswood Generating Station property. In 1976, the Ravenswood Gas Turbine Facility was present. The 16 gas turbines are visible, as are two tanks and associated buildings. The Rainey Tank Farm and the Rainey Substation (to the north, across 36th Avenue from the Ravenswood Gas Turbine Facility property) and the Vernon Substation (to the south of the Ravenswood Generating Station property) were also built before the 1976 aerial photograph was taken. The facility area remains relatively unchanged in the 1980 and 1996 aerial photographs, with the addition of a white-roofed building on the eastern portion of the Ravenswood Gas Turbine Facility property.

3.0 SITE INVESTIGATION SCOPE OF WORK

This section provides an overview of the field activities to be performed as part of the Phase II Site Investigation at Ravenswood. Further details associated with the field activities are provided in the Field Sampling Plan (Appendix A).

3.1 WORK PLAN APPENDED DOCUMENTS

The Site Investigation Work Plan includes a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP), and a Site-specific Environmental Health and Safety Plan (EHS Plan), as provided in Appendices A, B, and C, respectively.

The FSP (Appendix A) defines and specifies all sample collection and data gathering techniques. All techniques to be employed during implementation of the field program will be consistent with the NYSDEC requirements.

The QAPP (Appendix B) describes the protocols and procedures to be utilized to verify that all project work is performed according to the established analytical and engineering procedures in place. The QAPP will also describe the protocols and procedures to be used and will identify the project personnel responsible for such activities. The QAPP will establish the data quality objectives (DQOs) for the project as outlined in Appendix B.

The Site-specific EHS Plan (Appendix C) was prepared in accordance with 29 CFR 1910.120, Electrical Maintenance Standards, and local New York City applicable standards, such that the health and safety of all persons on or in the vicinity of the project Site during implementation of field activities are protected. The EHS Plan addresses those concerns and risks identified in the hazard analysis and outlines mitigative measures to be implemented. The hazard analysis was performed as part of the pre-planning process. The EHS Plan designates that competent persons with the following minimal requirements be allowed to work at the site: appropriate OSHA health and safety training and certifications, up to date medical monitoring requirements, experience on investigating properties with complex underground and overhead electrical utility constraints, and knowledge of the Site-specific COI. In addition, daily health and safety briefings outlining the field activities scheduled for the day and risk/mitigative measures to be employed are specified. The EHS Plan was prepared by the Foster Wheeler Environmental Health and Safety Officer with a Certified Industrial Hygienist (CIH) certification under the direction of the Foster Wheeler Environmental Regional Corporate Health and Safety Manager. In the event that an unforeseen condition or a change in scope is encountered during the program, Foster Wheeler Environmental will amend the EHS Plan as necessary to ensure the health and safety of all persons on or near the Site during the performance of the work.

3.2 SITE RECONNAISSANCE

The purpose of the site reconnaissance task is to verify and mark proposed sampling locations, waste storage locations, and the location for placement of the decontamination pad(s). The site

reconnaissance task will be attended by Con Edison representatives, Foster Wheeler Environmental's Project and/or Field Manager/Health and Safety Officer (HSO), and representatives from Aquifer Drilling & Testing and Allstate Power Vac (APV). Due to the complexity of underground and overhead utilities at the Site, Foster Wheeler Environmental will coordinate with the Underground Facilities Protective Organization (UFPO), the Con Edison Project Manager and Construction Management personnel to clear the sampling locations. Foster Wheeler Environmental will implement the Code 53 call and Con Edison will obtain the necessary street or sidewalk opening permits. Con Edison's Construction Management Group will M-scope an area around all sampling locations and identify subsurface utilities prior to the start of field activities. Foster Wheeler Environmental, through UFPO, will contact local utility companies (i.e., telephone, gas, electric, cable, water, sewer, etc.) at least one week prior to this site visit. This will allow these companies time to provide an underground utility markout at the site prior to the site visit such that Con Edison and Foster Wheeler Environmental personnel can review utility markouts, in relation to the approved Work Plan sampling locations.

At this site visit, all proposed soil boring and monitoring well sampling locations (Exhibit 2-1) will be evaluated and marked with paint on the ground surface to avoid obvious overhead (within 25 feet) or known underground obstructions/conduits. The locations will be evaluated against the utility markouts, overhead obstructions, and all engineering drawings and plans of the site made available by Con Edison. All parties involved in the drilling and sampling tasks will be made aware of these concerns, potential risks, and appropriate mitigation measures. The sampling locations will be finalized during this visit, incorporating Con Edison's comments.

Based on the site reconnaissance walkover, locations for the decontamination pad storage area for drummed cuttings and waste fluids generated during the Site Investigation and an area for mobilized equipment and materials will be identified.

3.3 FIELD SAMPLING ACTIVITIES

Following the Site reconnaissance task, Foster Wheeler Environmental will mobilize the necessary equipment, manpower, and materials to the Site. The drilling subcontractor, Aquifer Drilling & Testing, will set-up the decontamination pad and decontaminate all subsurface sampling and drilling equipment in accordance with the FSP. The schedule and location for implementation of these field activities will minimize the impact on on-going operations. Foster Wheeler Environmental will also support Con Edison in acquiring the necessary on-site work permits and street or sidewalk opening permits prior to the start of work. Con Edison Construction Management personnel will obtain and hold these daily permits and will authorize the start of work each day.

Prior to admittance to the site, all personnel will view the Ravenswood safety video and daily morning health and safety briefings will be performed prior to the start of each workday. The daily health and safety meeting will review the activities to be performed and the area to be worked in. Procedures to minimize all health and safety concerns for the planned work activities will be reviewed with all project personnel by the Foster Wheeler Environmental Site Manager

and Con Edison's Environmental Manager. Foster Wheeler Environmental will minimize impact to ongoing Con Edison operations at the Site. Therefore, personal interaction and coordination between Foster Wheeler Environmental and Con Edison's Construction Management and on-site personnel will be essential during performance of the Site Investigation field activities, to ensure that the work is performed efficiently and in accordance with safe work practices. Foster Wheeler Environmental will work with Con Edison's Construction Management and on-site representatives in scheduling work aside from on-site operations to minimize disruptions and/or outage requirements. On a daily basis, Foster Wheeler Environmental will notify Con Edison representatives of the upcoming day's events and scheduled field activities.

The field activities associated with the site investigation will be implemented in the most cost effective manner. The basis for each sampling location is discussed in Section 3.4. The sampling locations have been selected to provide information for the characterization impacts of the known spill areas and the former MGP site operations.

3.3.1 Subsurface Soil Sampling

A total of 20 borings 3 hand sample locations, and 3 vacuum excavated trenches are proposed to be performed to assess near surface and subsurface soils. Soil samples from these explorations will be analyzed to determine impact by past spills and/or releases. The soil borings will also provide valuable lithologic and hydrogeologic data to support the evaluation of subsurface migration pathways at the site and evaluate the vertical and horizontal extent of contamination. Prior to starting the soil boring or trench excavation, the surface material (concrete or asphalt) will be cut and removed by the drilling contractor. Existing bluestone cover will be removed and placed on the site for surface restoration. The top 5 feet at each soil boring location will be hand dug or the soil will be removed to this depth by vacuum excavation to clear any underground utilities if present. The soil sampling locations correspond to the known spills/releases on the site and former MGP facility locations. The soil sample depth and analyses for each specific release type are discussed in Section 3.4.

Soil Borings

Soil borings will be advanced in this cleared excavation through a depth approximately five feet below the water table or to the top of competent bedrock surface. Drilling methods and details on subsurface soil sampling are provided in the FSP. Continuous split-spoon samples will be collected from each soil boring. All split-spoon samples will be visually, olfactory, and instrumentally screened for petroleum residues or staining and other chemical constituents. Instrument field screening will be performed using photoionization detectors (PID). Also, PID equipment will be used for continuous monitoring for potential air emissions in accordance with the EHS Plan during all field excavation and soil boring installations. The soil samples will be logged and classified with respect to the United Soil Classification System (USCS). All soil boring data, instrumental readings, and observations will be documented in the field logbook. Odors will be noted with particular attention paid to soil descriptions where Non-Aqueous Phase Liquids

(NAPLs) are observed. The descriptions will also be in accordance with the USEPA Guidance, Ground Water Issue, Dense Nonaqueous Phase Liquids (Huling and Weaver). Two to three soil samples from each boring will be selected for laboratory analysis, based on the conditions discussed in Section 3.4, Area-Specific Sampling Plan. The sampling and handling requirements will be per NYSDEC guidance.

Following the completion of the soil borings and sampling, the boreholes will be abandoned with a cement-bentonite grout. Soil cuttings generated during the drilling process will be returned to the partially grouted borehole (50%) unless they are visually determined to contain free product or other waste material. Once the cuttings have been added the remainder of the borehole will be grouted to the undersurface of the surface cover materials. Cuttings that are visually determined to contain these materials will be stored in Department of Transportation (DOT) approved 55-gallon drums at the sample location and moved at the end of each day to an on-site location approved by Con Edison. Foster Wheeler Environmental will then sample and analyze the soils for hazardous waste characteristics, organic TCLP, PCBs, and TPH. Con Edison will characterize and properly dispose of these wastes following NYSDEC guidance.

Hand Auger Sampling

The hand sampling will be conducted in areas where the reported release is anticipated to have impacted only the stone ground cover and near surface soils. These hand excavated locations will be extended to a depth 5 feet below the surface. Two samples per location will be collected, one at the base of the stone cover and the second at the vertical limit of contamination based on visual observation and field screening or at the bottom of the excavation. The hand excavation will be backfilled with the excavated material.

Trenches

Vacuum excavated trenches will be conducted specifically to explore the perimeter walls of the former MGP site gas holders. These trenches will be excavated perpendicular to the holder perimeter walls and extending from inside of the former holder to outside of the holder perimeter. It is anticipated that only one hand sample will be collected from each trench at a depth based on field screening results. The trenches will be extended to a depth of 10 feet. If it is determined that a depth sufficient to expose the former holder wall cannot be reached using these methods, an alternative method will be evaluated taking into consideration physical constraints of the site. The vacuum trench excavation will be backfilled with the excavated materials unless these materials are grossly contaminated with coal tar. In the latter case, the excavated material would be properly disposed of and the excavation filled with clean fill.

3.3.2 Monitoring Well Installation and Groundwater Sampling

A total of five monitoring wells will be installed as part of the Phase II investigation. Five soil borings will be completed as monitoring wells MW-RV1 through MW-RV5 at the location shown in Exhibit 2-1. The wells and information collected from them will provide data on the

up- and downgradient water quality at the site, in addition to groundwater flow direction, soil type, and evidence of subsurface soil contamination, if any. The location and elevation of each monitoring well will be surveyed as described in Section 3.7.

The monitoring wells will be 2-inch diameter PVC wells and the screened interval will straddle the water table which is located approximately 8 to 15 feet below the ground surface based on the location. The monitoring wells will be drilled in accordance with the procedures discussed for the borings above to a depth corresponding to approximately five feet below the water table or to the top of bedrock, whichever is encountered first. The monitoring wells will be screened using two-inch PVC 0.020 slot screen with a two foot sump below the screen if it can be accommodated above the bedrock surface. The casing will be flush joint with O-rings between riser connections. The slot size may be altered pending the results of the subsurface drilling program. The screen section annular space will be filled with an appropriate sized sand pack and a cement-bentonite grout will be used above the screened section. The wells will be completed with a flush mount road box. This configuration, screened across the water table or water-bearing zone with a sump attached, allows for monitoring of petroleum-related contaminants that could potentially be "floating" on the water table or water-bearing surface.

Three 4-inch diameter wells RMW-2 through RMW-4 will be installed. These wells are being installed at the request of the NYSDEC to extend the free product and groundwater quality monitoring around mounded Tank F06-3 (Exhibit 2-2) required under the Ravenswood Major Oil Storage Facility (MOSF) license. The wells will be installed using four-inch PVC screen 0.020 slot screen straddling the water table with a two foot sump. The sand packing, grouting and well completion will be the same as for the 2-inch wells.

All monitoring wells will be developed no sooner than 24 hours after installation is complete. The wells will be developed by the surge and evacuate method in accordance with NYSDEC guidance. This method will minimize the affect of fine-grained soils that would increase the turbidity of the groundwater samples and thus interfere with groundwater quality analyses. This method also increases the hydraulic contact between the gravel pack and the natural formation material. Further details on well construction and development are provided in the FSP.

One round of groundwater samples will be collected from the five 2 inch diameter monitoring wells installed as part of the Phase II investigation. During the groundwater sampling event, a round of water level measurements will be collected from each of the wells with an oil/water interface probe. The presence/absence of LNAPL on the top of the water table surface will also be noted in the field logbook along with the water level measurements. Further details of the groundwater sampling task are outlined in the FSP. The 4-inch diameter monitoring wells being installed around the No. 6 bermed fuel oil tank will not be sampled for chemical analysis and are being installed solely for Con Edison to extend its monitoring for free product in the vicinity of the tank.

3.3.3 Waste Management

Investigation derived wastes (IDW) will be generated during implementation of the Site Investigation. These will include visibly impacted soil cuttings, purge water, decontamination fluids, plastic, asphalt/concrete, and personal protective equipment (PPE). These wastes will be containerized. The soil and other solid wastes will be containerized in drums or a roll-off box provided by Con Edison. At each sample location IDW will be placed in a 55-gallon drum, at the end of each day the drummed waste will be transported to the roll-off box. Any drums used for containerization will be properly stored at designated areas identified by Con Edison. Foster Wheeler Environmental will sample and analyze the IDW for hazardous waste characteristics (TCLP, TPH and PCB), Con Edison will characterize the wastes and properly dispose of these materials.

Water from the well developing/decontamination will be containerized on site in a temporary aboveground Poly storage tank or drums. Decontamination/purge water generated during the monitoring well installations/development process will be containerized in the tank or drums and stored at the site. Foster Wheeler Environmental will then sample and analyze the water for hazardous waste characteristics, organic TCLP, PCBs, and TPH. Con Edison will characterize and properly dispose of the water. Further waste handling details are provided in the FSP.

3.4 AREA-SPECIFIC SAMPLING PLAN

Each of the identified environmental conditions will be investigated as required to determine the nature and extent of impact resulting from past releases. The investigation will determine the degree of impact to near surface and subsurface soils and groundwater by collection of soil and groundwater sample for chemical analysis. NYSDEC Analytical Services Protocol (ASP) will be followed for analysis of all samples. The sampling and analytical procedures are presented in the FSP and QAPP, Appendices A and B, respectively. This section provides a description of the sampling and analysis proposed for each of the identified environmental conditions presented by area.

3.4.1 Bluestone and Soil Contamination in Vicinity of Generator Transformers

Two areas are identified where transformer oil was released to the adjacent bluestone surface and possibly to the underlying soils. These areas are the Unit 1 Generator Transformers east and west (1E and 1W), and the Unit 3 Generator transformers north and south (3N and 3S).

Transformer 3N and 3S - Two hand sample locations HS-1 and HS-2, will be excavated through and below the bluestone surface surrounding the 3N and 3W transformers (Exhibit 2-1). The locations will be selected based on field observation, and will be excavated by hand digging or using a vacuum to a depth of 5 feet. The soil underlying the stone will visibly be inspected for oil contamination. One sample will be collected at the stone/soil interface and a second soil sample will be collected at the apparent vertical limit of oil contamination based on field observations of both of the excavations. If oil contamination is apparent in the soil to the bottom of the hand excavation, extending the exploration using hollow stem auger equipment and split-spoon samples

will be evaluated based on the field observations and analytical results. If a boring is required it will be located just beyond the western fence line of the transformer area. The boring will be extended to the water table or the top of bedrock, whichever is less. The soil sample for analysis will be collected at the apparent vertical limit of the oil contamination or at the water table which ever comes first. The soil samples collected from transformer 3N and 3S areas will be analyzed for TPH and PCBs.

Transformer 1E and 1W - Due to limited access within the transformers fenced area, borings will be installed just beyond the fence limit and used to investigate this area. Two borings SB-1 and SB-2, will be located just south of the southern fence line, one adjacent to 1E and one adjacent to 1W (Exhibit 2-1). At each location the upper 5 feet will be cleared by hand excavation or vacuum excavation to a depth of 5 feet. Below the cleared depth, the boring will be advanced using a hollow stem auger with continuous split-spoon sampling. The boring will be drilled to the water table or top of bedrock surface, which ever is shallower. Two soil samples will be collected from each boring for chemical analyses. One soil sample will be collected from a depth corresponding to just below the bluestone layer within the transformer area, and one at the bottom of any observed oil contamination or the bottom of the borehole, which ever is shallower. The anticipated boring depth is 10 feet below the ground surface. The soil samples collected will be analyzed for TPH and PCBs.

3.4.2 Consent Order Appendix B Oil Spills

Appendix B of the 1994 Consent Order identified seven oil spill incidents that will be addressed during this investigation. Six of the oil spills are within the Ravenswood Facility limits and one is within the Vernon Substation located south of and adjacent to Ravenswood (Exhibit 2-1). The oil spill incidents are reported in 4 cases to have resulted in the release of No. 6 fuel oil or dielectric fluid (cable oil) to the ground surface, and in one case, the release of No. 6 fuel oil within a basement of the Generating Station. The two remaining cases consist of reports of an oil sheen of unknown origin in the adjacent East River. The following provides a description of the investigative activities planned for each of the oil spill incidences.

Items 2, 3 and 7, based on the existing information, did not result in a release to surface or subsurface soil. Item 2 was a release to the station basement and is reported to have been contained and totally cleaned up. Item 3 consisted of an oil sheen at the station's common outfall (Exhibit 2-2) of unknown origin that was cleaned up by Con Edison's cleanup contractor. Item 7 also has an oil sheen observed adjacent to Boiler House "A" (Exhibit 2-2) and is believed to be the result of contaminant in-flow to a sewer pipe that was subsequently rerouted. In each of these cases no sampling is currently planned, rather, existing information has been reviewed and inspections of the areas will be performed during the site reconnaissance to confirm that no additional work in these areas can be supported, and the spills closed out.

Item 1 - A 1994 spill of No. 6 fuel oil over a 50 x 50 foot area of bluestone covered the station yard, located just northeast of the No. 6 Fuel Oil Tank (Exhibit 2-2). The released oil is reported

o have been cleaned-up. To investigate this area two locations will be sampled, one SB-3 within ; feet of the northeastern corner of the concrete containment structure for the fuel oil pump and a econd HS-3 about 50 feet northeast of the containment structure (Exhibit 2-2). Soil samples vill be collected by hand from below the bluestone or any apparent surface backfill from the :leanup at each location. At the location closest to the oil tank, a soil boring SB-3, will be ex-:ended to the base of any observed oil contamination or the water table, whichever is shallower, and a second soil sample will be collected there. The water table is estimated to be 10 feet deep in this area. The soil samples will be analyzed for TPH.

Item 4 - Oil contamination was observed and documented on three soil boring logs drilled in the area adjacent to and north of Boiler House "A" (Exhibit 2-2). Two borings SB-4 and MW-RV3, will be performed in this area to investigate the reported oil. These borings will also be used in a dual fashion, to assess former MGP structures in this area. One will also be completed as monitoring well MW-RV3. It is estimated that the borings will have to be extended to a depth of approximately 35 feet. Three samples are planned to be collected from each boring, one within the depth of 2 to 10 feet based on field screening and observations, one at the water table and one at the bottom of the boring to determine if dense nonaqueous phase liquids (DNAPL) is present. Since these borings are also in the former MGP area, analyses relative to the MGP (BTEX, PAH, and cyanide) in addition to TPH will be performed and are discussed in a subsequent section.

Item 5 - A dielectric fluid release (110 gallons) from a blown pot head onto the bluestone surface in the Vernon Substation occurred. The spill was contained and cleaned by a Con Edison contractor. To investigate this area, one location, HS-4, will be sampled to demonstrate that previous remedial action was complete. The specific location will be selected in the spill 5 area (Exhibit 2-1) based on the site reconnaissance. At this location, soil samples will be collected at the base of the bluestone or any backfill from the previous remedial action activities. The samples will be obtained by hand. The excavation will be extended to the base of any observed oil contamination or five feet, which ever is shallower, and then a second hand sample will be collected. If contamination appears to extend below five feet, the need for a boring will be evaluated based on field observation and hand sample results. The samples collected will be analyzed for TPH and dielectric fluids per method 8100.

Item 6 - A 39,000 gallon spill of No. 6 fuel oil occurred in the stone covered yard area north and east of the Generating Station precipitators (Exhibit 2-1). This area was also occupied by several structures used in the former MGP site operations. A total of six borings (SB-5 through SB-9), and MW-RV1 will be used to investigate the No. 6 oil spill. Of these, four have a dual purpose and are also being used in investigating former MGP structures. Based on experience, these structures commonly contain MGP residuals and remnants from the MGP operations. Locations of the proposed borings are shown on Exhibit 2-1, the final boring locations will vary based on site clearing for underground utilities. The two borings SB-5 and MW-RV1, performed only for the No. 6 oil spill will be sampled first at the base of the existing stone/asphalt cover and below any backfill from the previous cleanup or underlying concrete mat. Additional samples will be

collected at the lower limit of any observed oil contamination or the top of the water table, whichever is shallower. The soil samples will be analyzed for TPH to assess the presence of No. 6 fuel oil. The remaining four borings SB-6 through SB-9, in this area are also being used as part of the MGP site investigation. Samples and analyses at those locations will also be used to assess the No. 6 oil spill. In addition to the six borings, as part of the MGP site investigation, three vacuum excavated trenches T-1 through T-3 will be performed to investigate the exterior wall areas of former Gas Holders 2, 3 and 4 (Exhibit 2-1). These excavations will also be inspected for evidence of the No. 6 fuel oil spill and if oil is observed at depth, additional TPH sampling will be performed.

3.4.3 Former MGP Site

The site plan and other drawings indicate the location of several structures associated with the former MGP operations that had the potential for past releases to the environment based on our experience at other MGP sites. These include Boiler House "A", oil tanks north of Boiler House "A", Generators A and B, Boiler House "B", Tar Wells and Tar Tanks, the Purifier House and boxes, former Gas Holders Nos. 1 (currently the Fresh Water Reservoir), 2, 3 and 4, the gas condenser, the Oil Gas Tank, the toluol plant, and the Tar Separator. The goal of the investigation at the former MGP Site is to determine the nature and extent of contamination in soil and groundwater as a result of these past operations. The former MGP structures listed above are shown on Exhibit 2-1. Some of the potential sources are not accessible because the location of the former MGP structure is beneath the existing Ravenswood Generating Station building. To investigate the former MGP site, Foster Wheeler has identified 15 boring locations SB-4, SB-6 through SB-15 and MW-RV2 through MW-RV5, within or adjacent to the former MGP structures (shown on Exhibit 2-1). In addition, at each of former Gas Holder Nos. 2, 3 and 4, at least one vacuum excavated trench (T-1 through T-3) will be performed across the former holder wall. This trenching is planned because, based on Foster Wheeler Environmental's experience, steel plates located adjacent to the holder tank wall may exist acting as collection points for residues.

At four of the boring locations, 2-inch diameter PVC wells, MW-RV2 through MW-RV5, will be installed to determine if groundwater has been impacted from these former MGP operations. One well MW-R1 will be installed as an upgradient well, adjacent to Vernon Boulevard at the eastern Facility boundary. Well MW-RV2 will be installed downgradient of the former gas holders. Three additional monitoring wells (MW-RV3 through MW-RV5) are planned downgradient between the former MGP site and the East River to assess downgradient impact from the operating MGP area. The monitoring well locations are shown on Exhibit 2-1.

In the former MGP site, Foster Wheeler Environmental proposes to drill borings within or adjacent to the former MGP structures (i.e., holders, separators, etc.) and obtain 2 soil samples from depths that, based on visual observation and field screening, appear to be the most contaminated. In the area of Appendix B spill Item #4, however, 3 soil samples will be collected according to the criteria described for spill Item #4. Continuous split-spoon sampling will continue below the 5-foot deep cleared hand or vacuum excavation to the top of the water table or the top of bed-

ock, whichever is shallower. Existing information indicates the base of former Gas Holder Nos. 2, 3, and 4 were excavated as much as five feet into bedrock. Therefore, the boring performed within the gas holders will be extended to the base, anticipated to be a concrete slab at a depth of 15 feet below the existing grade.

The vacuum excavated trenches T-1 through T-3 will be dug across the former gas holder walls to a depth of 10 feet and used to determine the type and integrity of the holder and wall, if any MGP residuals are present, and verify that potential contaminants have not collected between plates associated with the former holder walls. One soil sample will be collected from each trench excavation based on visual observation and field screening that indicates the highest contamination.

The soil samples from the former MGP site will be analyzed for Polycyclic Aromatic Hydrocarbons (PAHs), BTEX, and cyanides. PAH analyses are traditionally used to characterize soil contamination associated with former MGP sites.

The approach Foster Wheeler Environmental has taken to address the groundwater beneath the site and assess whether the groundwater has been impacted by the historical MGP operations is to position monitoring wells for the collection of groundwater and samples up and downgradient of MGP structures. One upgradient well MW-RV1 is proposed at the eastern Facility boundary adjacent to Vernon Boulevard. This upgradient location will provide information on the quality of groundwater entering the site and should be the hydrostatic high point for the site. Well MW-RV2 has been situated to assess potential releases from MGP structures, located in the central portion of the former MGP site as they may be effected by the storage of water in the Fresh Water Reservoir. This monitoring well will also provide information in the vicinity of the fresh water reservoir which may represent a local groundwater recharge area, thus providing additional hydraulic driving force for groundwater and cause the migration of contaminants in this area of the site. Therefore, a well is required at this location to provide information on groundwater quality and contaminant migration rates which may differ significantly at this location than for the rest of the site. Three wells MW-RV3, MW-RV4 and MW-RV5 are positioned downgradient along the East River and will provide information on the overall downgradient impact of the former MGP site on the groundwater and discharge to the East River. Water level measurement obtained from these wells will also assist in determining the rate and direction of groundwater flow on-site.

Groundwater samples will be collected in accordance with the FSP. The groundwater samples will be analyzed for TCL Volatile Organic Compounds and TCL Semi-Volatile Organic Compounds.

3.5 DATA QUALITY OBJECTIVES

Foster Wheeler Environmental recognizes that the results of the proposed environmental site Investigation will undergo a detailed review by NYSDEC, Con Edison and potentially by prospec-

tive site buyers. To support these results, laboratory analyses will be conducted in accordance with NYSDEC ASP protocols, and Category B deliverables. As part of the ASP analyses, Accutest will generate analytical packages for Foster Wheeler.

Laboratory analysis data will be used to characterize site-related groundwater contamination. Groundwater analytical data will be evaluated with respect to potential exposure pathways and potential impacts to public health and environment. Data from on-site and downgradient monitoring wells will be compared to upgradient well data to differentiate site-related contamination from that potentially due to upgradient sources. Soil sample laboratory analysis will be used in conjunction with existing information and field observation to characterize the degree and extent of existing soil contamination at the site.

3.6 QA/QC SAMPLES

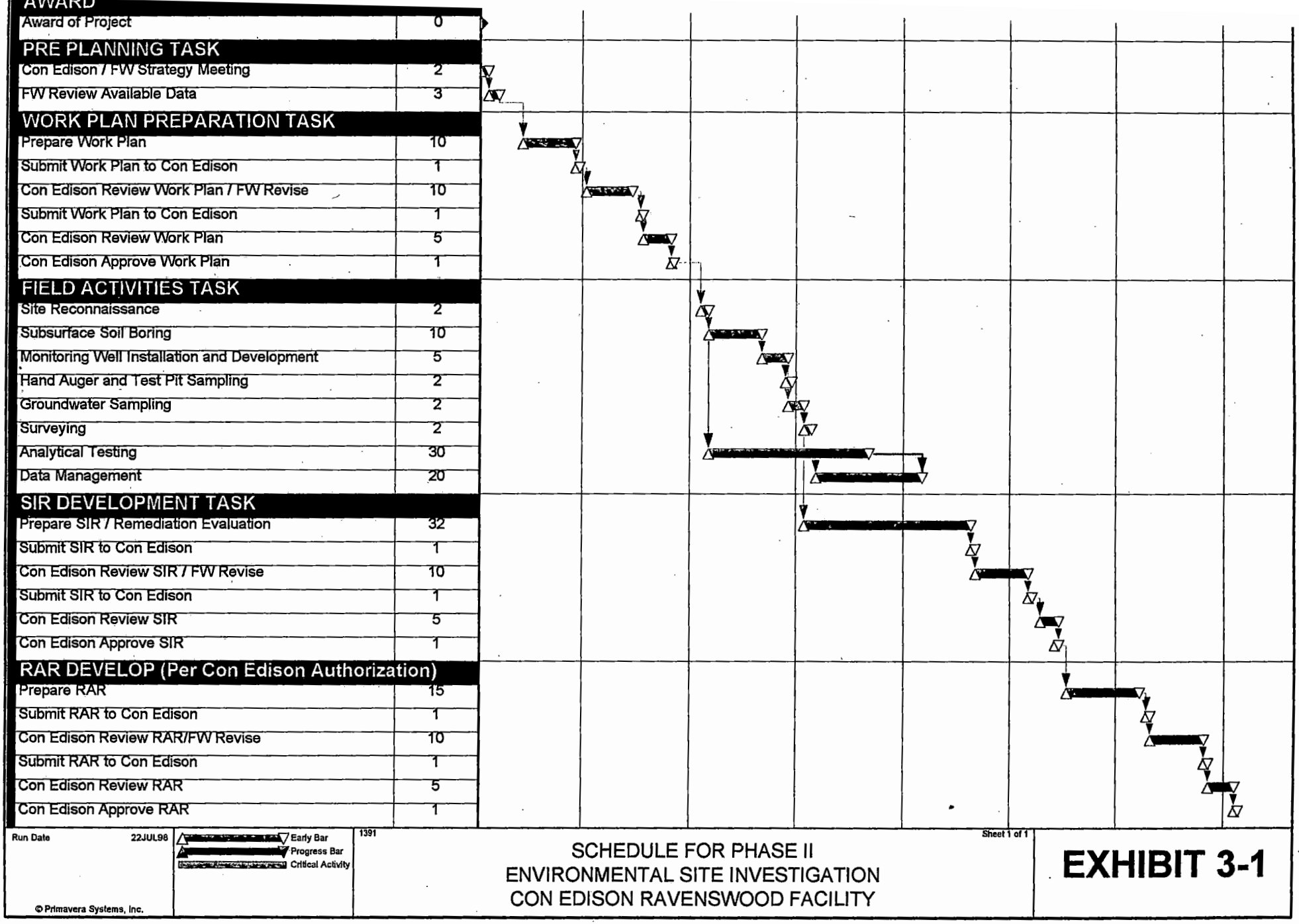
An integral part of the overall analytical program is the collection of appropriate QA/QC samples. Field blanks will be analyzed to verify the appropriateness of field decontamination techniques for sampling equipment. Field blanks will be analyzed at a frequency of 1 per 20 samples for the same parameters as the associated environmental samples. Trip blanks will only accompany shipments of groundwater samples to be analyzed for volatile organics. Duplicate samples will be analyzed at a frequency of 1 per 20 environmental media for those parameters for which the parent media samples are analyzed. Matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a frequency of 1 per 20 field samples or one per week. The reproducibility and homogeneity of the samples will be assessed by determining the RPD for both spike and non-spike compounds. Coded field duplicates will be collected to determine the reproducibility and homogeneity of samples. The samples are "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. The frequency of collection of these samples is 1 per 20 field samples.

3.7 SURVEYING

Following the installation of the monitoring wells and drilling of the soil borings, Foster Wheeler Environmental will have all sampling locations surveyed by Massand Engineering, L.S., P.C., an existing Con Edison vendor. At each soil boring and monitoring well, the horizontal location and the ground surface elevation will be surveyed to the nearest 0.1 foot. In addition, vertical location of both the inner and outer well casings will be surveyed to the nearest 0.01 foot. The inner casing will be scribed and marked as a future point from which water level measurements will be collected. The data will be forwarded to Foster Wheeler within two weeks and the sampling locations will be noted on the Ravenswood Site Plan.

3.8 SCHEDULE

The schedule for implementation of the Environmental Site Investigation is provided as Exhibit 3-1. This schedule meets Con Edison requirements and is consistent with Foster Wheeler's experience on similar environmental site Investigations.



SCHEDULE FOR PHASE II
ENVIRONMENTAL SITE INVESTIGATION
CON EDISON RAVENSWOOD FACILITY

EXHIBIT 3-1

3.9 SITE INVESTIGATION REPORT

Preparation of the draft Site Investigation Report (SIR) will be initiated following the completion of the site investigation field activities. Exhibit 3-2 presents a preliminary Table of Contents for a draft SIR. The draft SIR will contain the following:

- A detailed and comprehensive description of all tasks completed to date;
- Results of the Site Investigation activities, analytical testing program and receptor and exposure pathway evaluation;
- Conclusions and Recommendations;
- Additional needs, if required, by applicable portions of the CO, CERCLA, NCP, and NYSDEC guidelines; and
- Certification that the Site Investigation was performed in accordance with the NYSDEC approved Work Plan.

As part of the discussion on the results of the field investigation activities, Foster Wheeler Environmental will evaluate the fate and transport of the Site-specific contaminants. Of particular note, this evaluation will be focused on the manmade pathways and Site-specific geology/hydrogeology.

As part of the draft SIR, a receptor and exposure pathway evaluation for the Ravenswood Facility will be performed through:

Step 1: Identifying chemicals released to the environment (soil, groundwater, surface water);

Step 2: Performing an exposure pathway analysis; and

Step 3: Identifying potential environmental receptors.

Steps 1 through 3 will be developed initially at the Ravenswood Generating Station in order to allow for a screening risk evaluation. This section of the Work Plan briefly discusses the exposure pathway and receptor evaluation.

Identification of chemicals released to the environment at the Ravenswood Facility is one of the purposes of the field program and analytical protocol, discussed previously in the Work Plan. Using the field and laboratory data potential exposure pathways will be identified. Relevant pathways could include direct contact with contaminated soil and surface water (i.e., dermal exposure), and incidental inhalation and ingestion of contaminated soil and surface water.

The pathway evaluation will be used in conjunction with fate and transport analysis and discussions with Con Edison personnel to identify potential receptors. Preliminary analysis indicates that site workers are likely receptors in the course of performing routine occupational activities, such as walking on-site or through the utility excavations.

Exhibit 3-2
Draft SIR
Example Table of Contents

1.0 EXECUTIVE SUMMARY
- 1.1 Site Background
- 1.2 Site Assessment
  - 1.2.1 Project Objectives
  - 1.2.2 Hydrogeological Investigation Results
  - 1.2.3 Subsurface Soil Investigation Results
  - 1.2.4 Groundwater Investigation Results
- 1.3 Conclusion

2.0 INTRODUCTION
- 2.1 Purpose and Project Objectives of Site Investigation
- 2.2 Site Location and Description
- 2.3 Site History
- 2.4 Site Setting

2.4.1 Surface Conditions
2.4.2 Subsurface Conditions

3.0 SCOPE OF WORK
- 3.1 Introduction
- 3.2 Field Investigation
  - 3.2.1 Field Mobilization
  - 3.2.2 Subsurface Soil Sampling/Analysis
  - 3.2.3 Monitoring Well Installation and Development
  - 3.2.4 Groundwater Sampling/Analysis
  - 3.2.5 Groundwater Level Measurements
  - 3.2.6 Surveying
  - 3.2.7 Waste Management

4.0 SITE INVESTIGATION RESULTS
- 4.1 Site Subsurface Conditions

4.1.1 Soil and Bedrock
4.1.2 Groundwater Flow
- 4.2 Analytical Results by Area
  - 4.2.1 Soil Sample Results
  - 4.2.2 Ground Sample Results

4.3 Site Characterization

5.0 CONTAMINANT FATE AND TRANSPORT
- 5.1 Analytical Results by Environmental Media
- 5.2 Receptor and Exposure Pathway Evaluation

Exhibit 3-2
Draft SIR
Example Table of Contents (Cont'd)

7.0 CONCLUSIONS

7.1 Conclusions

APPENDICES

A Soil Boring and Monitoring Well Logs
B Monitoring Well Construction Details
C Surveying Data
D Analytical Data